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EFFECT OF COPPER-ZINC PYRITE ORE ON THE PROCESSES OF FREE RADICAL OXIDATION IN KIDNEY TISSUE.

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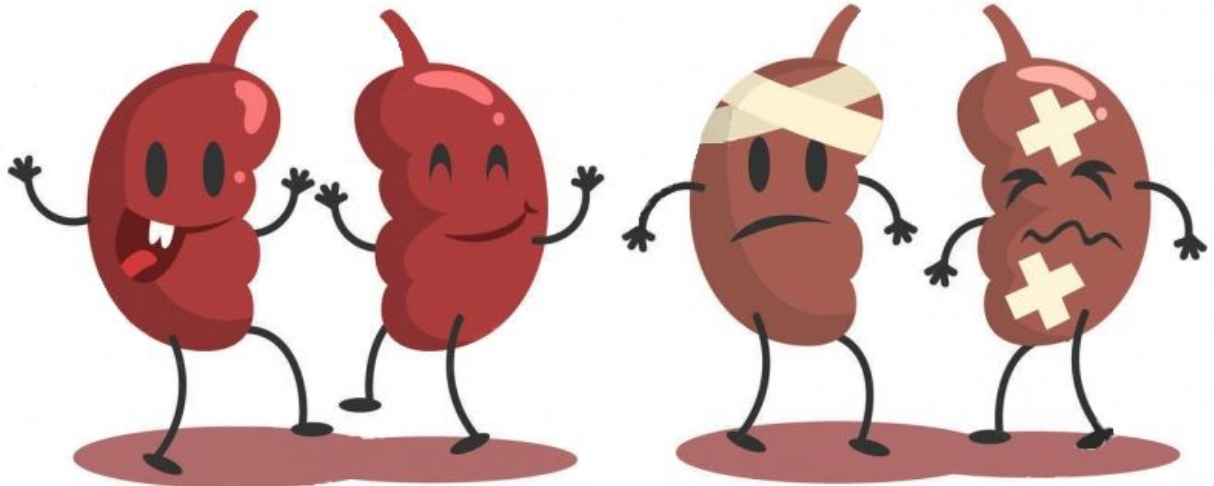
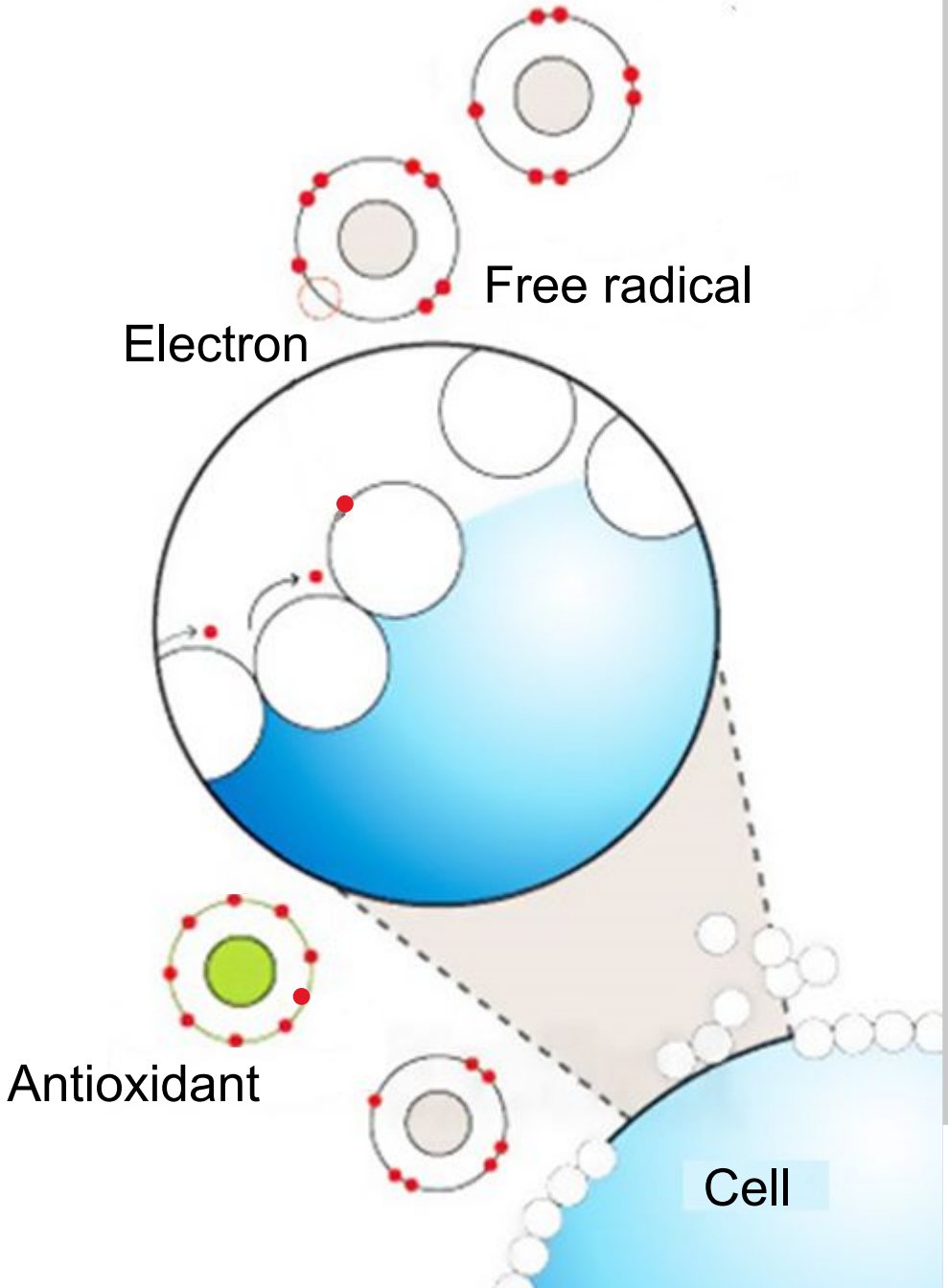
Employees of the mining industry have constant contact with the ore, so the problem of intoxication of workers with heavy metals continues to maintain its relevance.

The ore

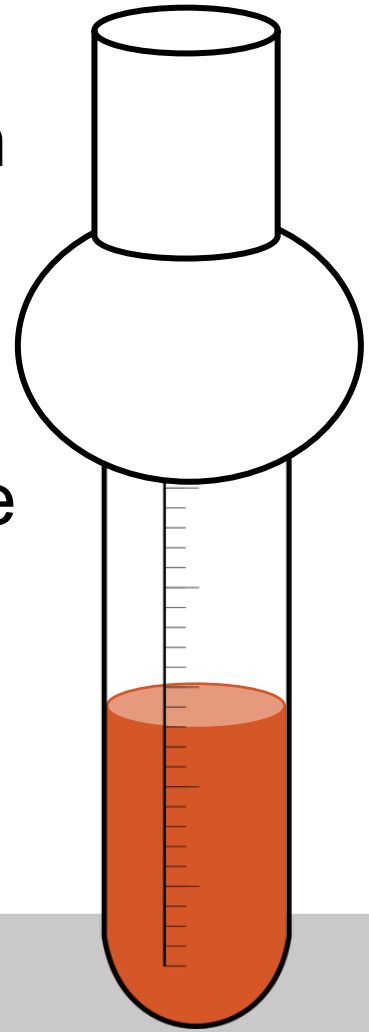
Heavy metals content in the body and, accordingly, their influence on different organs and systems in persons who have contact with ore. The influence of its components launches the pathophysiological process in bone tissue, liver and other organs.



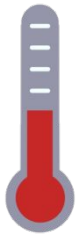

Free radical
Electron
Antioxidant
Cell

The aim of our research was to study the state of free radical oxidation in the tissue of the kidneys of rats with copper-zinc pyrite intoxication.

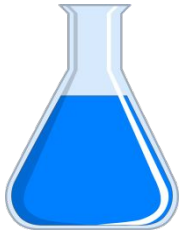
The kidneys were removed and homogenized for 5 minutes at t°-4°C. The ratio was 1.0 g of tissue per 5 ml of phosphate buffer. Further dilution was carried out in phosphate buffer to a ratio of 1 mg/ml, then 20 ml were taken, which placed in the chamber of the luminomer, and luminescence initiated by the addition of 1 ml of a 50 mM solution of ferrous sulfate was registered.



5 minutes

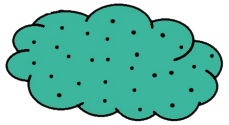


t^0= 4°C



$1g/_{5ml} \rightarrow 1g/_{1ml}$

Phosphate buffer



$FeSO_4$
1ml of a 50mM

The device HL-003 was used for registration processes of free radical oxidation arising from the interaction of free radicals.

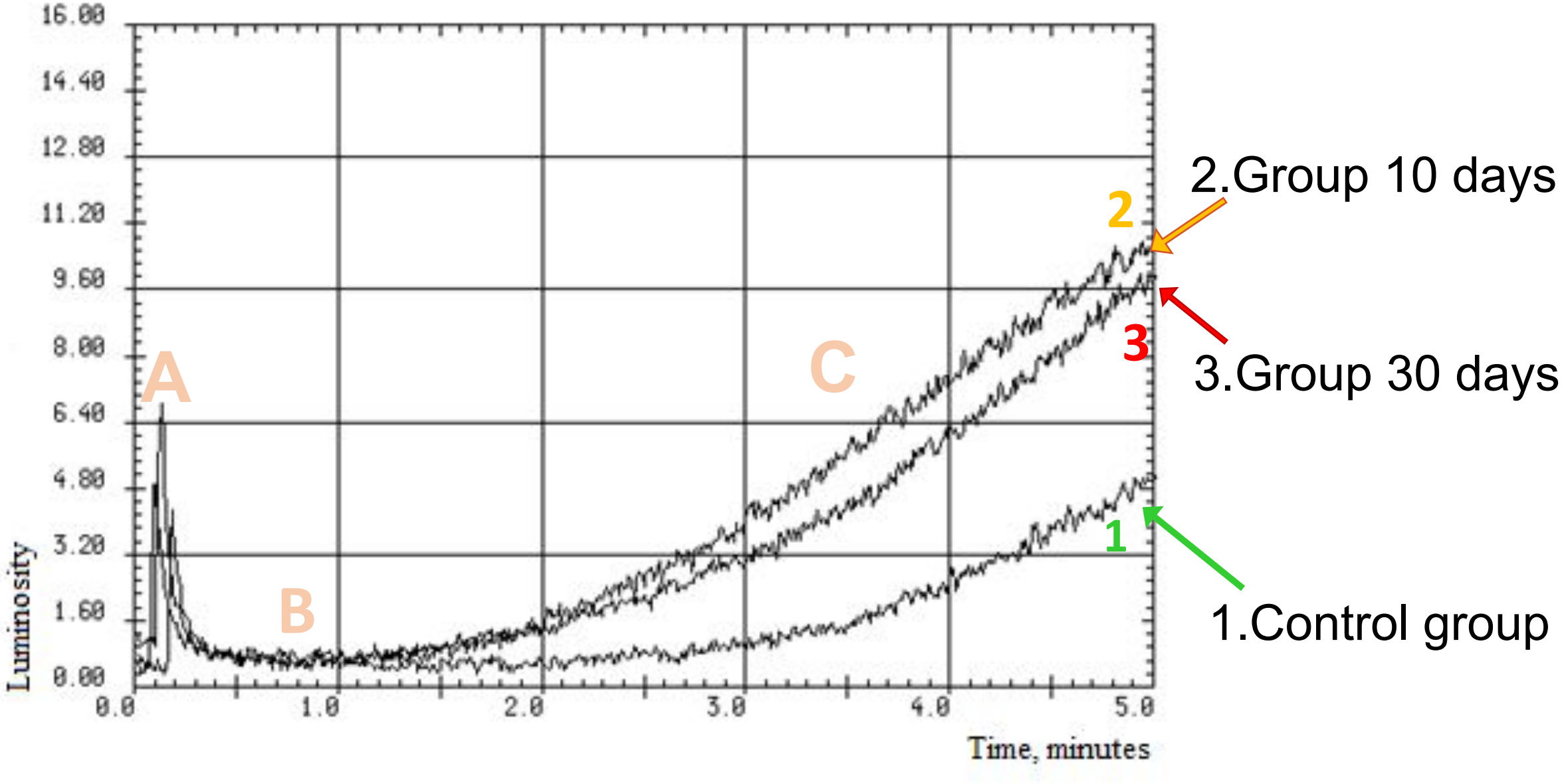
Results and their discussion

Luminescence values in rat kidney homogenate.

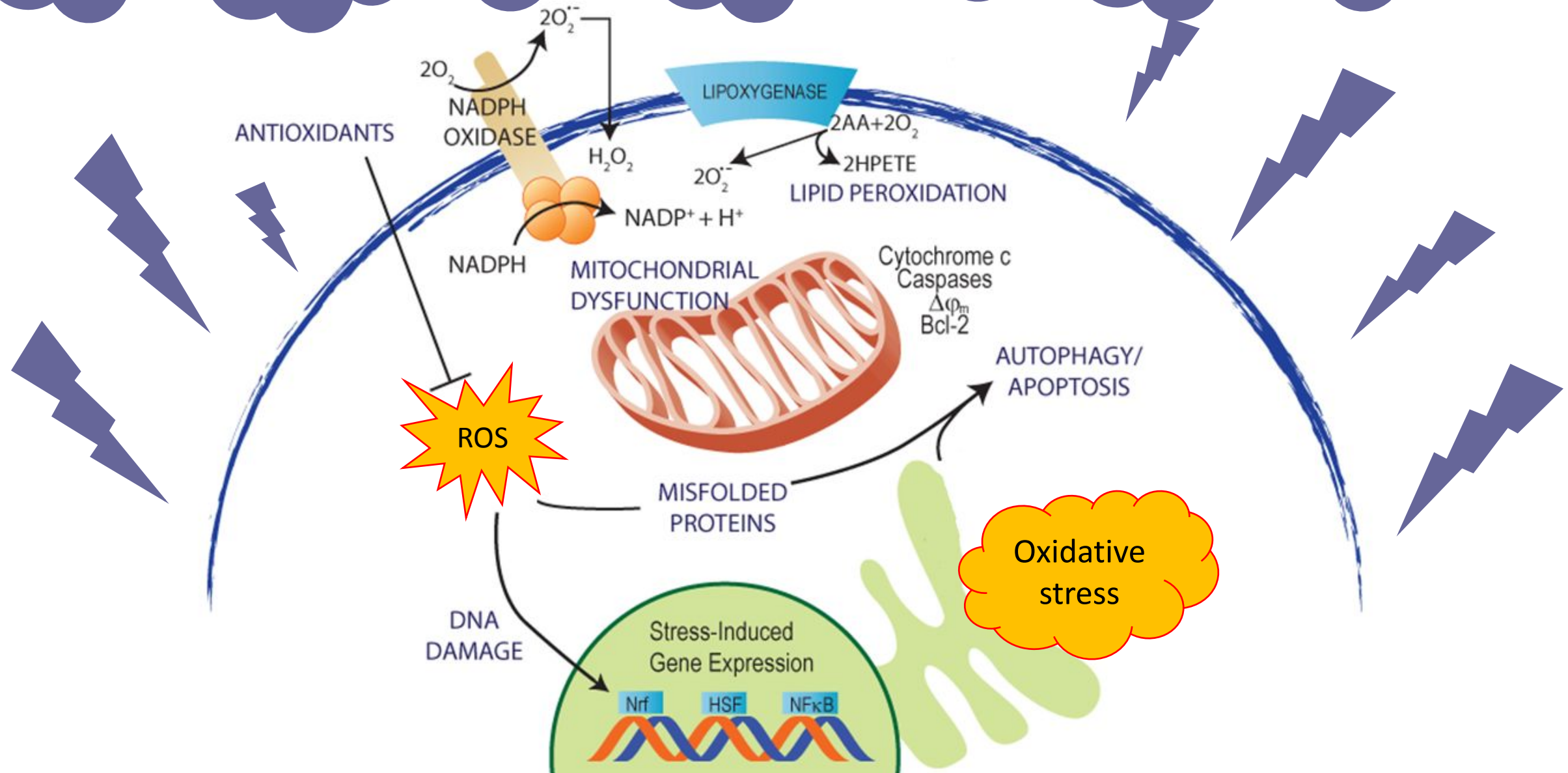
Rats groups	Kidney homogenate	
	The light sum of the luminescence (S)	The slow flash (I max)
Control n=10	23,82±2,68	6,90±0,88
Experimental-10 days n=10	41,89±2,37**	15,79±0,80**
Experimental - 20 days n=10	38,38±4,19**	15,37±0,92**
Experimental - 30 days n=10	38,25±5,4*	16,88±1,84**

Note: the reliability of differences in the values of the experimental groups on the 10th, 20th and 30th day of the experiment in relation to the control group with * - p≤0,05 and ** - p≤0,01.

Record CL homogenate of rats kidneys in the control (1) and experimental groups: for 10 days (2) and 30 days of research (3).



The ore


$2O_2^{\bullet-}$
$2O_2$
NADPH
OXIDASE
ANTIOXIDANTS
LIPOXYGENASE
$2AA+2O_2$
2HPETE
LIPID PEROXIDATION
H_2O_2
$2O_2^{\bullet-}$
$NADP^+ + H^+$
NADPH
MITOCHONDRIAL
DYSFUNCTION
Cytochrome c
Caspases
$\Delta\varphi_m$
Bcl-2
AUTOPHAGY/
APOPTOSIS
ROS
MISFOLDED
PROTEINS
Oxidative
stress
DNA
DAMAGE
Stress-Induced
Gene Expression
Nrf
HSF
NFκB

Conclusions.

The injection of copper-zinc pyrite ore to rats caused an increase in the chemiluminescence of the kidney's homogenate, starting from the 10th day of the research, remaining at a high level up to 30 days, which testifies to the acceleration of lipid peroxidation processes in the renal tissue.

My personal contribution in this scientific research:

1) Care of rats.

2) Decapitation and all surgical manipulations with rats.

3) Weighing and preparing homogenized organs.

4) Work with chemiluminomer.

Thanks for attention!